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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/066,871	02/04/2002	Greg D. U'Ren	01CON312P	4782

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EXAMINER

NGUYEN, JOSEPH H

ART UNIT	PAPER NUMBER
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2815

DATE MAILED: 09/15/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/066,871

Applicant(s)

U'REN ET AL.

Examiner

Joseph Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 August 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 February 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 7.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

Claims 1-5, 8-16, 19-21 are rejected under 35 U.S.C. 102(e) as being anticipated by Takagi et al.

Regarding claim 1, Takagi et al discloses on figure 13b a heterojunction bipolar transistor comprising a base 4 having a concentration of a first material (C content) at a first depth, said concentration of said first material impeding diffusion of a base dopant (B concentration) wherein said first material causes a change in band gap at said first depth in said base; said base 4 having a concentration of a second material (Ge

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content), said concentration of said second material having a step increase at said first depth so as to counteract said change in said band gap.

Regarding claim 2, Takagi et al discloses on figure 13b said first material is carbon.

Regarding claim 3, Takagi et al discloses on figure 13b said base dopant is boron.

Regarding claim 4, Takagi et al discloses on figure 13b said first material is carbon and wherein said base dopant is boron.

Regarding claim 5, Takagi et al discloses on figure 13b said first material causes an increase in said band gap at said first depth in said base.

Regarding claim 8, Takagi et al discloses on figure 13b said first material is carbon and wherein said second material is germanium.

Regarding claim 9, Takagi et al discloses on figure 13b said heterojunction bipolar transistor is an NPN silicon germanium heterojunction bipolar transistor.

Regarding claims 10-11, Takagi et al discloses on figure 13b all the structures set forth in the claimed invention.

Regarding claim 12, Takagi et al discloses on figure 13b a method for fabricating a heterojunction bipolar transistor, said method comprising steps of adding a concentration of a first material (C content) to a base 4 at a first depth in said base, said concentration of said first material impeding diffusion of a base dopant (B concentration), said first material causing a change in band gap of said base; step

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increasing a concentration of a second material (Ge content) at said first depth in said base so as to counteract said change in said band gap.

Regarding claims 13-16, 19-21, Tagaki et al discloses on figure 13b all step of the method set forth in the claimed invention.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 6-7, 17-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tagaki et al as applied to claims 1 and 12 above.

Regarding claims 6 and 17, Tagaki et al discloses substantially all the structures (or steps of the method) except said second material being increased at said first depth by an amount required to cause a decrease in said band gap to be substantially equal to said increase in said band gap caused by said concentration of said first material. However, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to modify Tagaki et al by having said second material being increased at said first depth by an amount required to cause a decrease in said band gap to be substantially equal to said increase in said band gap caused by said concentration of said first material for the purpose of improving the structure and performance of a heterojunction bipolar transistor, since it has been held that

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discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Regarding claims 7 and 18, Tagaki et al discloses substantially all the structures (or steps of the method) except said second material being increased at said first depth by an amount required to cause a decrease in said band gap to be equal to said increase in said band gap caused by said concentration of said first material. However, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to modify Tagaki et al by having said second material being increased at said first depth by an amount required to cause a decrease in said band gap to be equal to said increase in said band gap caused by said concentration of said first material for the purpose of improving the structure and performance of a heterojunction bipolar transistor, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Response to Arguments

Applicant's arguments filed on 8/15/2003 have been fully considered but they are not persuasive.

Applicant argues that Takagi fails to disclose a concentration of a second material having a step increase at a first depth in a base so as to counter a change in band gap caused by a concentration of a first material at the first depth. However, Tagaki clearly discloses on figure 13b a concentration of a second material (Ge) having

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a step increase at a first depth in a base so as to counter a change in band gap caused by a concentration of a first material at the first depth. Note that the term "a step increase" is a broad term. It is clear that the second material (Ge) in figure 13b of Tagaki is increasing from region 4c to region 4b and there is a step increase at the first depth in region 4c therein. As such, Tagaki reads on the claimed invention.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

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Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph Nguyen whose telephone number is (703) 308-1269. The examiner can normally be reached on Monday-Friday, 7:30 am- 4:30 pm

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Lee can be reached on (703) 308-1690. The fax phone numbers for the organization where this application or proceeding is assigned is (703) 308-7382 for regular communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

JN
September 11, 2003

A handwritten signature in black ink, appearing to be 'Eddie Lee', written in a cursive style.

EDDIE LEE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800